THE EFFECTS OF MCKENZIE APPROACH AND KINESIO TAPING TECHNIQUE IN INDIVIDUALS WITH MECHANICAL LOW BACK PAIN

- A COMPARATIVE STUDY

Dissertation submitted to The Tamil Nadu Dr. M.G.R. Medical University towards partial fulfillment of the requirements of **MASTER OF PHYSIOTHERAPY (Advanced PT in Orthopaedics)** Degree Programme .

KMCH COLLEGE OF PHYSIOTHERAPY

(A unit of Kovai Medical Center Research and Educational Trust)

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CERTIFICATE

This is to certify that research work entitled **"THE EFFECTS OF MCKENZIE APPROACH AND KINESIO TAPING TECHNIQUE IN INDIVIDUALS WITH MECHANICAL LOW BACK PAIN"** – A comparative study was carried out by the candidate bearing the **Register No: 27111103,** KMCH College of Physiotherapy towards the partial fulfillment of the requirements of the **MASTER OF PHYSIOTHERAPY (Advanced PT in Orthopaedics)** of Tamil Nadu Dr. M.G.R Medical university, Chennai-32.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

OBJECTIVES

- To compare the effects of McKenzie approach and Kinesio Taping technique in individuals with Mechanical low back pain.

STUDY DESIGN:

- Quasi experimental study design.

STUDY SETTING:

- Department of physiotherapy, Kovai Medical Centre and Hospital, Coimbatore.

SAMPLE SIZE:

- 20 Patients with Mechanical low back pain who met the inclusion criteria were selected for the study.
  - GROUP- A : 10 Patients
  - GROUP- B : 10 Patients

INTERVENTION:

- Group A received McKenzie approach
- Group B received Kinesio taping

OUTCOME MEASURE:

- Pain status
- Functional ability

MEASUREMENT TOOLS:

- ❖ Modified Oswestry Disability Index Scale
- ❖ Visual Analogue Scale

RESULTS:

- ➢ The data were analyzed using paired, and independent ‘t’ tests at 5% level of significance. Even though, there was a significant improvement in both the groups, the McKenzie approach group showed a greater improvement when compared to Kinesio taping technique group.

CONCLUSION:

- ➢ The results of this study concluded that McKenzie’s approach is more effective therapy for mechanical low back pain patients.

KEYWORDS:

- Mechanical low back pain
- McKenzie approach
- Kinesio taping technique

1. INTRODUCTION

Low back pain with a life time prevalence of approximately 60-80% is recognized internationally as a major health, social and economic burden.[41]

Mechanical low back pain is one of the most common problems in modern society. It causes major economic problems in industrialized nations. It accounts for the second leading cause of absenteeism from work.[13]

Most back pain presenting in general practice is due to the dysfunction of element of mobile segment – that is, the two apophyseal joints, the ligamentous and muscular attachments. This problem often referred as mechanical pain, a general term which covers both radicular and non radicular pain, mainly includes dysfunction of the joint of the pain.[1]

Mechanical low back pain is described as a musculoskeletal pain which varies with physical activities and not involving root compression or series of spinal disease.[9] Bed rest is considered to be an effective management of acute low back pain. There is strong evidence that supports bed rest greater than two days is not effective in the treatment of acute low back pain. Restriction of activity is impressive for recovery from mechanical low back pain.

The sedentary nature of modern existence and lack of physical fitness makes humans so liable to back pain. The cause of lower spine being so commonly affected could be due to inherent skeletal abnormalities, poor posture, inability of lumbar spine musculature to control movements and protect against injury. Weakness of lumbar spine muscles has been highlighted as a potential factor in the etiology of back pain.

The McKenzie approach is popular among physiotherapists as a management for spinal pain.[21] It is said to be a progression of mechanical forces applied by or to a patient in such a way that a minimal amount is utilized to effect a therapeutic change in the presenting mechanical syndrome.[17]

McKenzie approach is a popular method for Mechanical low back pain. The McKenzie approaches are believed to improve functional abilities and reduce pain.

Kinesio Taping is another treatment approach used by physiotherapist to treat back pain

Kinesio taping differs from normal traditional taping in the sense that it is elastic and can be stretched to140% of its original length before being applied. Unlike the traditional white athletic tape, it provides a constant pulling (shear) force to the skin over which it is applied. The fabric is air permeable and water resistant and can be worn for repetitive days. Kinesio tape is currently being used immediately following injury and during the rehabilitation process.[26,27]

Mechanical low back pain patients are usually managed by conventional physiotherapy management which includes pain relieving modalities, stretching exercises for the spinal muscles and patient education.

Abundant studies were done on the effect of McKenzie approach but only few studies reported the benefits of McKenzie approach.

Kinesio taping is used for the management of mechanical low back pain. Many studies of Kinesio taping carried out for areas other than the back, only few studies reported the benefits of Kinesio taping on Mechanical low back pain

1.1.NEED FOR THE STUDY

A wide range of population with mechanical low back pain are being affected by functional deficits, which disturb the patient's work related activities and psychological status.

Mechanical low back pain patients are usually treated by physiotherapy modalities, stretching exercises for the spinal muscles and patient education. New concept of treatment is now carried out in western countries to give better effects in treating patients with mechanical low back pain. But it is not popular in India, even though there are physiotherapists practicing manual therapy.

However, in India, there is a need for more evidence based research in the clinical setups to substantiate whether the interventions like McKenzie approach and Kinesio Taping technique will be beneficial.

This study tend to contrast the effects of McKenzie approach and Kinesio Taping technique in individuals with Mechanical low back pain

1.2. AIM AND OBJECTIVES

AIM:

- To compare the effects of McKenzie approach and Kinesio Taping technique in individuals with Mechanical low back pain.

OBJECTIVES:

- To find out the effect of McKenzie approach on level of pain in individuals with Mechanical low back pain.
- To find out the effect of McKenzie approach on functional abilities of individuals with Mechanical low back pain.
- To find out the effect of Kinesio Taping technique on level of pain in individuals with Mechanical low back pain.
- To find out the effect of Kinesio Taping technique on functional abilities in individuals with Mechanical low back pain.
- To compare the effects of McKenzie approach and Kinesio Taping technique in individuals with Mechanical low back pain.

2. REVIEW OF LITERATURE

2.1. MECHANICAL LOW BACK PAIN:

2.1.1. Malcolm and Allen (1992)

Low back pain is defined as pain perceived to arise from the posterior region of the trunk within the area bounded more are less

Laterally by - lateral border of erector spinae

Superiorly by - imaginary line traversing through T12 Spinous process

Inferiorly by - imaginary line traversing through posterior superior iliac Spines[29]

2.1.2. John McCullon F.R.C.S.C (1997)

Back pain is a symptom and not a disease. Sedentary nature of modern existence and lack of physical exercise makes human beings so liable to back pain. The cause could be due to inherent skeletal abnormalities, poor posture, inability of human spine musculature to control movements and protect itself against injury, and also the properties of the disc.[23]

2.1.3. Alf Nachemon and Egon Johnson (2000):

Low back pain is a complex multi facet problem where the patient will be affected physically, psychologically, economically and recreationally. It has reached epidemic proportions.[32]

2.1.4. Saied Alemo (2008)

Mechanical low back pain is only a description of symptoms complex. One of the most common cause of low back pain is frozen back syndrome and the other sources are disc, nerve root, injured lumbar spine, soft tissue structures, facet joints, capsules and ligaments.[38]

2.1.5. Everett C Hills (2009)

The causes of mechanical low back pain are attributed to an acute trauma, but they may also include secondary trauma as an etiology. Mechanical low back pain due to secondary trauma tends to occur more commonly in work place.[14]

2.2. MCKENZIE APPROACH:

2.2.1. Ponte DJ, Jeson GJ, Kent BE: (1984)

In Low back pain patients, the McKenzie protocol was superior to the Williams protocol in decreasing pain and hastening the return of pain free range of motion.[34]

2.2.2. Andrew J.Cole, Stanley A.Herring :(1991)

The McKenzie's exercises cause reduction of symptoms with repetitive extension on motion pattern testing and pain centralizes with extension. They reduce intra discal pressure, allow anterior migration of nucleus pulposus and increase mechanoreceptor input.[2]

2.2.3. John A. Mcculloch, Ensor E. Transfeldt: (1999)

In their study explained The McKenzie program is designed to shift the nucleus pulposus forwards in the disc cavity, reducing its pressure effects on the posterior annulus and nerve roots. An effective extension program centralizes pain, that is reduces the radiating pain. The McKenzie program is more effective for leg pain that is increased by sitting.[23]

2.2.4. Lance. T.Twomey, James R.Taylor: (2000)

The McKenzie patients resolved their acute episode and disability faster and were better able to prevent recurrences and were able to minimize disability when symptoms did recur.The McKenzie's individualized end range movements chosen on the basis of centralization were as effective as manipulation in reducing pain.[28]

2.2.5. Skikić E Metal. (2003):

They studied the influence of McKenzie exercises on decreasing the pain in patients with low back pain, prevalance of Centralization sign is a indicator of good treatment outcomes and to evaluate use of McKenzie exercises, as a frequent approach for low back pain in Physical Medicine and Rehabilitation Centers. They found out that McKenzie exercises for low back pain are beneficial treatment for increasing flexibility of spine and improving the pain with better results. McKenzie exercises are effective method for decreasing and centralizing the pain and increasing spinal movements in patients with low back pain.[40]

2.2.6. Busanich BM, Verscheure SD. (2006):

They did a study to find the clinical evidence base for McKenzie therapy in management of back pain. They found that McKenzie therapy results in a decrease in short term (<3 months) pain and disability for low back pain patients compared with other standard treatments such as NSAIDS, educational booklet, back massage , back care advice, strength training and spinal mobilization under therapist supervision.[6]

2.2.7. Borrows J, Herbison P:

The McKenzie exercise program produced significantly better outcomes and functional improvements when compared to the other exercise regime.[7]

2.3. KINESIO TAPING TECHNIQUE

2.3.1. Travis Halseth (2004)

They conducted a study to find out the effects of Kinesio TM taping the anterio and lateral portion of the ankle Would enhance ankle proprioception compared to the un taped ankle. They had selected 30 subjects, 15 men, 15 Women, Ages 18-30 participated in this study. single group utilized in the experiment assessed by pre test and post test. Plantar flexion and inversion with 20° of plantar flexion reproduction of joint position sense (RJPS) were find out by using an ankle RJPS apparatus. The treatment group showed no change inconstant and absolute error for ankle RJPS in plantar flexion and 20º of plantar flexion with inversion when compared to the un taped results using the similar motions. Application of Kinesio TM tape does not appear to enhance proprioception (in terms of RJPS) in healthy individuals as determined by our measures of RJPS at the ankle in the motions of plantar flexion and 20º of plantar flexion with inversion[20].

2.3.2. Yasukawa A, (2006)

They conducted a study of the Kinesio Taping method for upper extremity in enhancing functional motor skills for children admitted into an acute rehabilitation program. They selected fifteen children (10 females and 5 males ; 4 to 16 years of age),who were taking rehabilitation services at the Rehabilitation Institute of Chicago for this study. Melbourne Assessment was used to measure upper limb functional changes prior to application of Kinesio Tape, soon after the application of the tape, and 3 days later . Children's upper-limb function was contrasted with three assessments using analysis of variance. It showed that improvement from pre to post taping was statistically significant, $F(1, 14) = 18.9$; $p < .02$. It suggest that Kinesio Tape may be associated with improvement in upper-extremity control and function in the acute pediatric rehabilitation setting.[43]

2.3.3. Yoshida A, Kahanov L.(2007)

This study has been done to find out the effects of kinesio taping (KT) on trunk flexion, extension, and lateral flexion. Thirty healthy subjects with no history of lower trunk

or back issues participated In this study. The Subjects had performed two experimental measurements of range of motion (with and without application of Kinesio Tape) in trunk flexion, extension, and right side flexion. A dependent t test was used to evaluate range of motion measurements before and after the application of Kinesio Tape. They have found that Kinesio Tape applied over the lower trunk may increase active lower trunk flexion range of motion.[42]

2.3.4. Fu TC, Wong AM (2008)

This study found the possible immediate and delayed effects of Kinesio taping on muscle strength in quadriceps and hamstring. The taping is applied to the anterior thigh of healthy young athletes. They selected fourteen healthy young athletes (seven males and seven females) without knee problems were included in this study. The subjects muscle strength was assessed by the isokinetic dynamometer under these conditions: (1) without taping; (2) immediately after taping; (3) 12h after taping with the tape

The statistical result showed that there was no significant difference in muscle power among these conditions. Kinesio taping on the anterior thigh neither decreased nor increased muscle strength in healthy non-injured young athletes.[15]

2.3.5. Thelen MD, PT et.al (2008)

They did the study to find out the short term clinical efficacy of Kinesio Tape in college students who had shoulder pain, and they compared with sham tape application. They did the study with Prospective, randomized, double-blinded, clinical trial using a repeated–measures design. They selected forty-two subjects clinically diagnosed with rotator cuff tendon impingement and randomly assigned then into 2 groups: therapeutic KT group or sham KT group taping for 2 consecutive 3day intervals. They concluded that the therapeutic KT group showed Immediate improvement in pain-free shoulder abduction after tape application. No other differences with ROM, pain, or disability scores at any time interval were found between the group. KT may be improving pain-free active ROM immediately after tape application for patients with shoulder pain.[30]

2.3.6. González - Iglesias J et.al (2009)

They did a study to find out the short - term effects of Kinesio Taping, on neck pain and cervical range of motion for acute whiplash-associated disorders. They have taken forty-one patients (21 females) were randomly assigned to 2 groups : the experimental group received Kinesio Taping to the cervical spine (applied with tension) and the placebo group received a sham Kinesio Taping application (applied without tension). The statistical result shows that significant improvements immediately following application of the Kinesio Tape than with the sham Kinesio tape and also Kinesio taping group showed improvement in 24- hour follow-up.[24]

2.3.7.Chen Hsu YHWY, Lin HC, Wang WT, Shih YF(2009)

In this study they investigated the effect of elastic taping in shoulder impingement to improve kinematics, muscle activity and strength of the scapular region in baseball players .The results analyzed the variance with repeated measures showed that the elastic taping significantly increased the scapular posterior tilt at 30 degrees and 60 degrees during arm raising and increased the lower trapezius muscle activity in 60-30 degrees arm lowering phase in comparison to the placebo taping.[19]

2.3.8. Adelaida Maria Castro-Sanchez,(2012):

They conducted a study on individuals with chronic non-specific low back pain and found statistically significant improvements immediately after the application of kinesio taping inability, pain, eccentric endurance of the trunk muscles ,and perhaps trunk flexion range of motion.[3]

2.4. MODIFIED OSWESTRY DISABILITY INDEX SCALE:

2.4.1. Fairbank, Jeremy C.T, Pynsent, Paul B : (2000)

The Modified Oswestry Disability Index Scale is one of the principal condition-specific outcome measures used in the evaluation of disability resulting from back pain. This Scale has been designed to give the therapist information as to how an individual's back pain affects one's ability to manage in everyday life.[16]

2.4.2. Julie M Fritz and James J Irrigang:(2001)

Modified Oswestry Low Back Pain disability scale shows higher levels of test - retest reliability and responsiveness compared with quebec back pain disability scale.[25]

2,4.3. Davidson M, Keating JL.(2002)

Measurement obtained with Oswestry Questionnaire, was the most reliable and had sufficient width scale too reliable to detect improvement or worsening in most subjects.[10]

2.4.4. Arja, Jari, Hannu, Olavi, Arto, ilkka.(2003)

Study concluded that Oswestry indices are clinically useful instrument in the evaluation of outcome.[4]

2.4.5. Bayar, Yakut,(2003)

Oswestry disability index scale seem to be a reliable and valid scale for assessing the disability of elderly patients with low back pain.[8]

2.5. VISUAL ANALOGUE SCALE:

2.5.1. Patrica . A.McGrath et al , 2007

They conducted a study in 2007 and suggested that Visual analogue scale is the most common simple scale used in pain research. It is the most widely used scale in assessment of pain in clinical setting and has been reported to be sensitive and reliable.[37]

2.5.2. Powers CM, Berreck GU, et al Apr.(2008)

In their study on effects of spinal mobilization and press up exercise on pain response in people with non specific low back pain, pain score before and after interventions was recorded with visual analogue scale.[35]

2.5.3. Bodian CA et al.,

When pain is an outcome measure in research studies, grouping final Visual Analogue Scale scores into a small number of categories provides greater clinical relevance for comparisons than using the full spectrum of measured values or changes in value.[12]

2.5.4. Mick.P.Couper, et al.,

Visual Analogue Scales (VAS) and other types of rating or category scales are a very common means of measuring both individuals' rating of their health, and their indulgence for other, hypothetical health states.[31]

2.5.5. LJ Deloach et al.,

Visual Analogue Scale was developed for assessing chronic pain but is often used in studies of post operative pain. This study finds that the visual Analogue Scale correlates with a verbal 11 point scale but that any individual determination has an imprecision of +/- 20 mm.[36]

MECHANICAL LOW BACK PAIN AND LIFE STYLE FACTORS :

- Lack of exercise
- Sedentary life style
- Bad working practices
- Poor posture :
    - Slouching,
    - Driving hunched position,
    - Poor standing posture,

POSTURE AND MECHANICAL LOW BACK PAIN:

The postural stress is the most common cause of the mechanical low back pain over a period of time, uncorrected poor posture can cause structural changes in the joints and wear and tear, as the long term effects of poor posture can be severe and cause harmful injury

THE RISK FACTORS FOR MECHANICAL LOW BACK PAIN:

❖ PHYSICAL WORK FACTOR

- Heavy manual work
- Lifting and Twisting
- Postural stress - Sitting, Driving
- Whole body vibration

❖ PSYCHOLOGICAL WORK FACTOR

- Social influences
- Monotonous work
- Low job satisfaction
- Lack of personal control – Stress, Anxiety, Fear, Tension, Depression

❖ PHYSIOLOGICAL FACTORS

- Low physical fitness
- Inadequate trunk rotation

❖ PERSONAL RISK FACTORS

- Hereditary
- Sex
- Age
- Body build

3. MATERIALS AND METHODOLOGY

3.1. STUDY DESIGN:

- Quasi experimental study design.

3.2. STUDY POPULATION:

- Mechanical low back pain individuals.

3.2.1. INCLUSION CRITERIA:

- Age : 20 – 40 years
- Male subjects
- Mechanical low back pain -Dysfunctional syndrome
- Physician diagnosis

3.2.2. EXCLUSION CRITERIA:

- Subjects with radiating pain such as Sciatica, Disc prolapse.
- Subjects with recent history of fall
- Subject with history of spinal Fracture
- Subjects with lumbar canal stenosis.
- Subject with tumour of spine
- Subject with infection of spine
- Subject with inflammatory disease of spine. - Like Ankylosing spondylitis
- Subject with structural deformities such as kyphosis, scholiosis and spondylolisthesis
- Subject with cardiovascular problems and neurological problems

3.3. SAMPLE SIZE:

- 20 Patients with Mechanical low back pain who met the inclusion criteria were selected for the study.
  - GROUP- A : 10 Patients
  - GROUP- B : 10 Patients

3.4. SAMPLING TECHNIQUE:

- Convenient sampling

3.5. STUDY SETTING:

- Department of physiotherapy, Kovai medical center and hospital, Coimbatore.

3.6. NULL HYPOTHESIS:

- **H_{01}**-There is no significant improvement on level of pain in individuals with Mechanical low back pain using McKenzie approach.
- **H_{02}**- There is no significant improvement on functional abilities in individuals with Mechanical low back pain using McKenzie approach.
- **H_{03}** -There is no significant improvement on level of pain in individuals with Mechanical low back pain using Kinesio Taping technique .
- **H_{04}**-There is no significant improvement on functional abilities in individuals with Mechanical low back pain using Kinesio Taping technique.
- **H_{05}** -There is no significant difference between McKenzie approach and Kinesio Taping technique in individuals with Mechanical low back pain.

3.7. STUDY METHOD:

- The study duration was 4 weeks. 20 Subjects who fulfils the inclusion criteria were assigned into two groups of 10 each. As group A, who received McKenzie approach and group B, who received Kinesio Taping.
- Pretest scores using VAS, and Modified Oswestry Disability Index Scale taken prior to the treatment protocol post test scores were taken after 4 weeks using the same.

3.7.1. TREATMENT PROCEDURE:

GROUP-A : MCKENZIE EXERCISES (Frequency- 2 times a day, Repetition- 10 times, Rest interval- 5 minutes, 3 Session per week)

EXTENSION IN PRONE LYING:

- Patient was asked to lie in prone with arms beside the body and head turned to one side and maintain the position for 4-5 minutes.
- In the same position, the patient was asked to place the elbows under the shoulders so that the patient lean on their forearms and maintain the position for 5 minutes.
- Then the patient was advised to extend their elbows in the above position and push the top half of their body as far as the pain permits. The patient held the position for a second or two and then comes back to the starting position. This was done ten times per session.

EXTENSION IN STANDING:

- The patient was asked to stand upright with feet slightly apart, hands placed at the back so that the fingers are pointed backward and the thumbs forward. The patient bends backward at the waist as far as they can keeping the knees straight, maintaining this position for a second or two and return to the starting position.

FLEXION IN SUPINE LYING:

- The patient was asked to lie supine with knees bent and foot placed on the couch. From this position the patient brings both the knees towards the chest and gently but firmly pulls the knees with hands towards the chest till pain permits. The patient maintains this position for 1-2 seconds and returns to starting position

FLEXION IN SITTING:

- Patient sat on the edge of a chair with knees and feet well apart and hands resting in between legs touching the ground. From this position the patient bends forward and returns back.

STANDING SIDE GLIDING:

- The Patient was asked to stand with the feet approximately at shoulder level. McKenzie prefers the patient to perform a side-gliding movement while standing instead of lateral bending. This movement is done by instructing the patient to move the pelvis and trunk to the opposite direction while maintaining the shoulders level in the horizontal plane. It should be repeated to the right and left and compare the degree and quality of movement. Patients may try to increase the motion by lifting their lower extremity off the floor and raising their hip. This is limited by stabilizing the pelvis with your arm as the patient performs the movement testing.

GROUP-B : KINESIO TAPING

- Three sessions per week

PROCEDURE:

- The patient was asked to bend forward to stretch back muscles. Apply “Y” strip lightly above the tailbone and extend up along each side of the spine, with very little stretch.
- Tear paper backing at middle of “Y” strip. Still bent forward, add light to moderate stretch and place the center of the tape over strained area.
- Lay down ends with no stretch
- Space tape is applied over the “Y” strip in a star like form.

3.8. OUTCOME MEASURES:

- Pain status
- Functional abilities

3.8.1. MEASUREMENT TOOLS:

- Visual Analogue Scale
- Modified Oswestry Disability Index Scale

3.9. STATISTICAL ANALYSIS:

- Pre-test and post-test values of the study were collected and assessed for variation in improvement and their results was analysed using independent 't' test and paired 't'test.

INDEPENDENT `t' TEST (between groups)

$$t = \frac{\overline{X1} - \overline{X2}}{S} \sqrt{\frac{n_1 n_2}{(n_1 + n_2)}}$$

Where,

$$S = \sqrt{\frac{\sum d_1^2 + \sum d_2^2}{n_1 + n_{2-}2}}$$

PAIRED `t' TEST (within groups)

- Post test values of the study will be collected and assessed for variation in each group and their results will be analysed using paired 't'test.

$$t = \frac{\bar{d}\sqrt{n}}{S}$$ Where,

$$S = \sqrt{\frac{\sum d^2 - \left[\bar{d}\right]^2 \times n}{n-1}}$$

- **S** = Combined standard deviation
- $\mathbf{d_1}$ **&** $\mathbf{d_2}$ = difference between initial and final readings in a experimental group & contro group
- $\mathbf{n_1}$**&**$\mathbf{n_2}$= number of patients in a experimental group & control group
- $\mathbf{X_1}$**&**$\mathbf{X_2}$ = mean of a experimental group & control group

4. DATA PRESENTATION

4.1. TABULATION

MODIFIED OSWESTRY DISABILITY INDEX SCALE-

PAIRED ‘t’ TEST (GROUP-A: MCKENZIE APPROACH)

PRE TEST VS POST TEST

Scale	Mean value		Calculated ‘t’ value	Table ‘t’ value	Level of significance
	Pre test	Post test			
Modified oswestry disability index score	23.79	16.98	15.1065	2.2621	0.05

PAIRED ‘t’ TEST(GROUP-B: KINESIO TAPING)

PRE TEST VS POST TEST

Scale	Mean value		Calculated ‘t’ value	Table ‘t’ Value	Level of significance
	Pre test	Post test			
Modified oswestry disability index score	23.15	18.97	14.1623	2.2621	0.05

INDEPENDENT ‘t’ TEST:

MODIFIED OSWESTRY DISABILTY INDEX SCALE

MCKENZIE PRE TEST VS TAPING PRE TEST

Scale	Mean value		Calculated ‘t’ value	Table ‘t’ Value	Level of significance
	Group A	Group B			
Modified oswestry disability index score	23.79	23.15	0.5148	2.1009	0.05

MCKENZIE POST TEST VS TAPING POST TEST

Scale	Mean value		Calculated ‘t’ value	Table ‘t’ Value	Level of significance
	Group A	Group B			
Modified oswestry disability index score	16.98	18.97	2.2228	2.1009	0.05

VISUAL ANALOUGE SCALE

PAIRED ‘t’ TEST (GROUP-A: MCKENZIE APPROACH)

PRE TEST VS POST TEST

Scale	Mean value		Calculated ‘t’ value	Table ‘t’ value	Level of significance
	Pre test	Post test			
VAS	6.6	3.2	14.1421	2.2621	0.05

PAIRED ‘t’ TEST (GROUP-B: KINESIO TAPING)

PRE TEST VS POST TEST

Scale	Mean value		Calculated ‘t’ value	Table ‘t’ Value	Level of significance
	Pre test	Post test			
VAS	6.4	4.4	12.000	2.2621	0.05

VISUAL ANALOUGE SCALE

INDEPENDENT ‘t’ TEST:

MCKENZIE PRE TEST VS TAPING PRE TEST

Scale	Mean value		Calculated ‘t’ value	Table ‘t’ Value	Level of significance
	Group A	Group B			
VAS	6.6	6.4	0.6493	2.1009	0.05

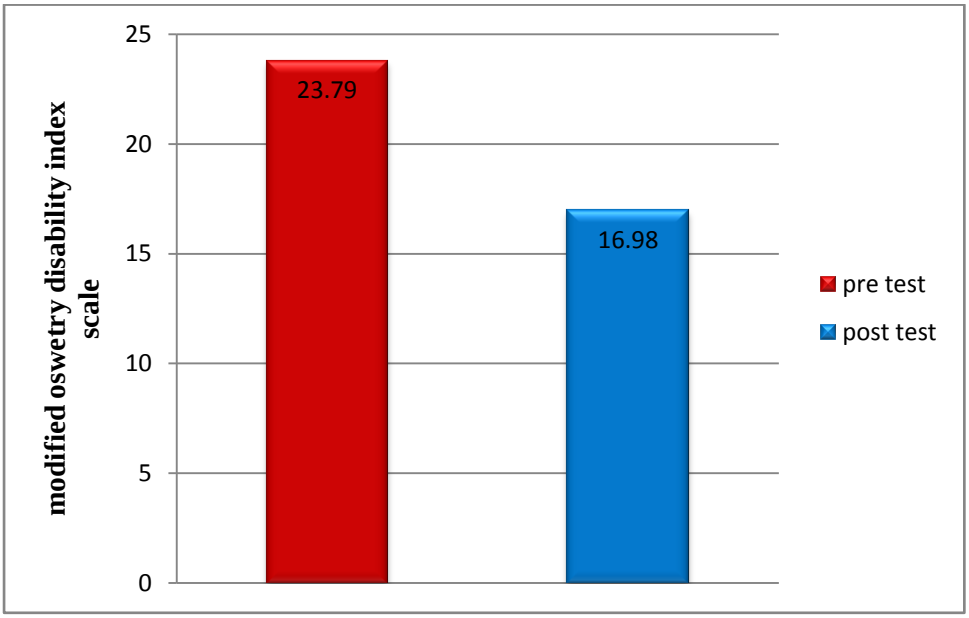
MCKENZIE POST TEST VS TAPING POST TEST

Scale	Mean value		Calculated ‘t’ value	Table ‘t’ Value	Level of significance
	Group A	Group B			
VAS	3.2	4.4	3.2478	2.1009	0.05

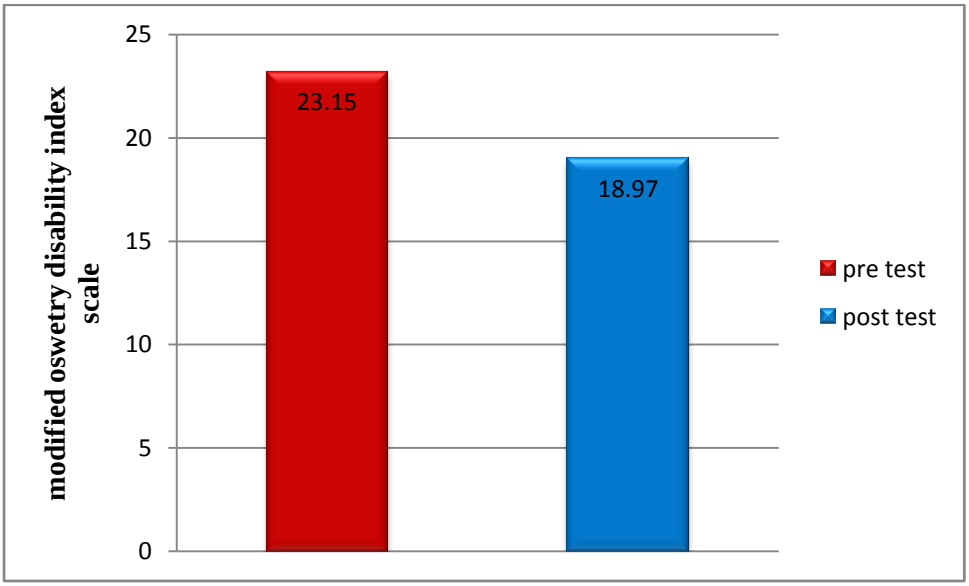
4.2. GRAPHICAL REPRESENTATION

MODIFIED OSWESTRY INDEX SCALE

PAIRED 't' TEST - PRE TEST VS POST TEST (GROUP-A: MCKENZIE APPROACH)

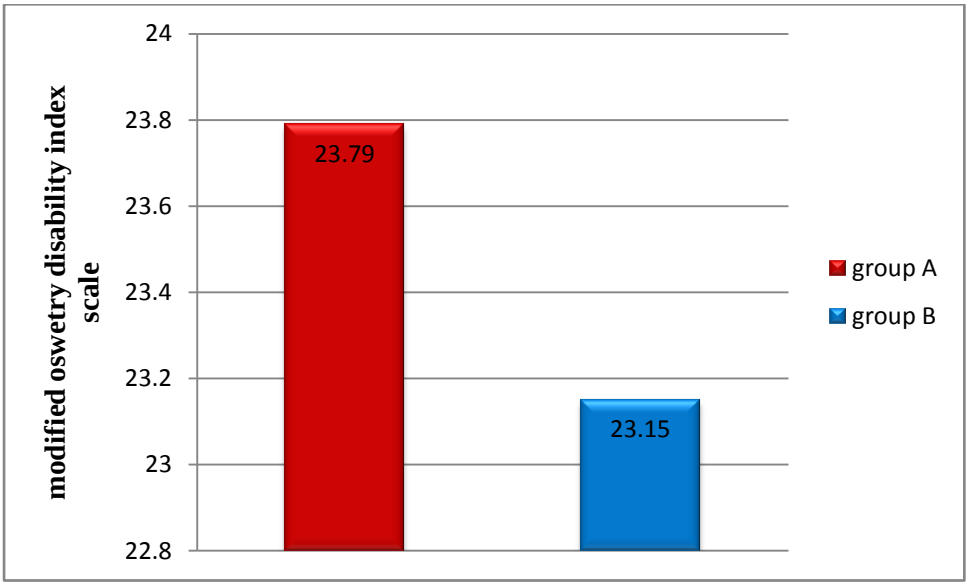


PAIRED 't' TEST - PRE TEST VS POST TEST (GROUP-B: KINESIO TAPING)

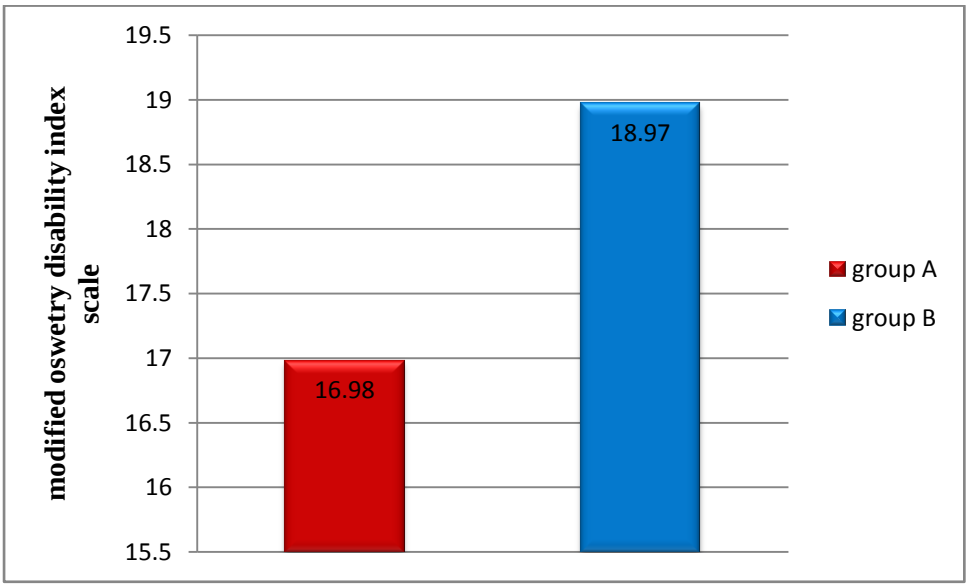


INDEPENDENT ‘t’ TEST:

MCKENZIE PRE TEST VS TAPING PRE TEST



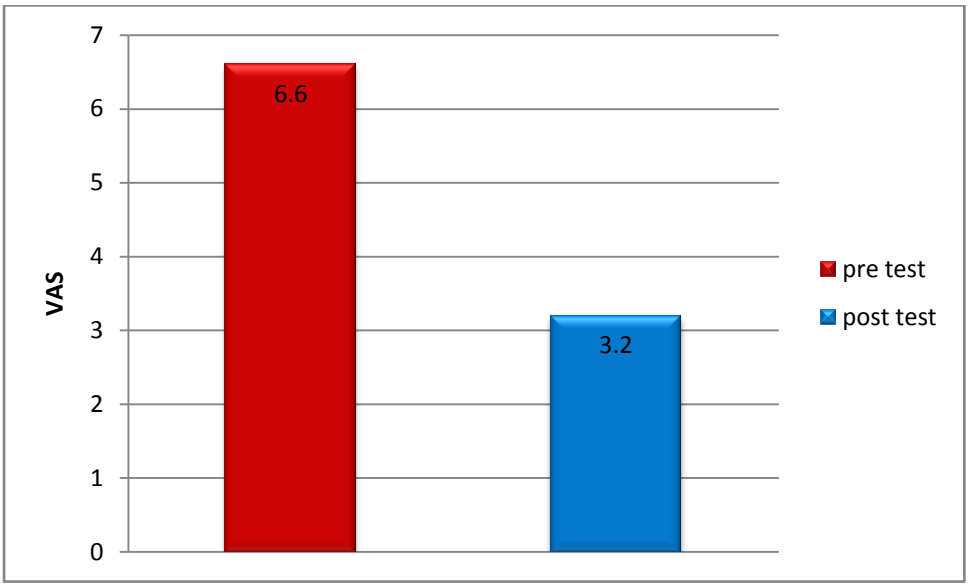
MCKENZIE POST TEST VS TAPING POST TEST



VISUAL ANALOUGE SCALE

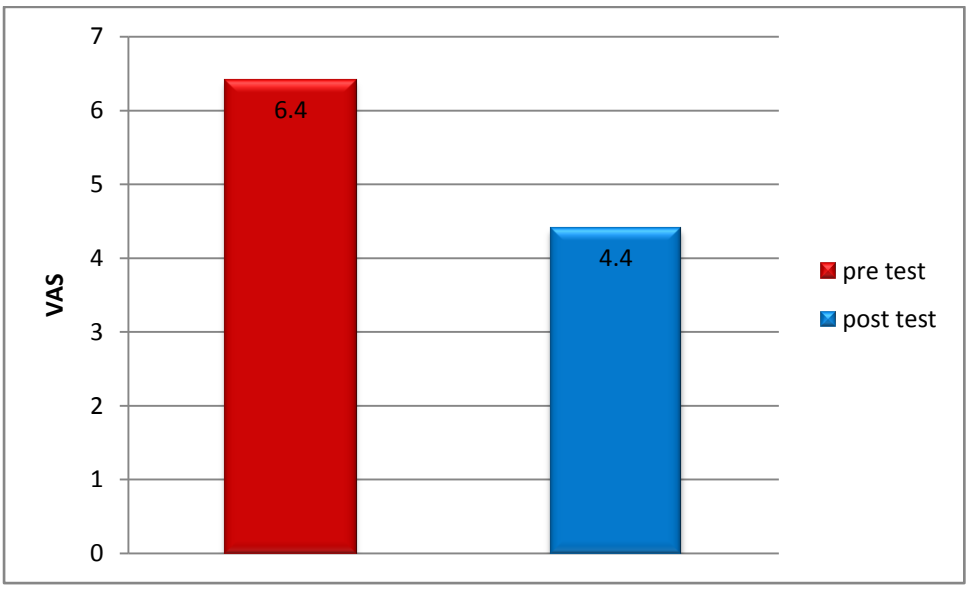
PAIRED ‘t’ TEST (GROUP-A: MCKENZIE APPROACH)

PRE TEST VS POST TEST



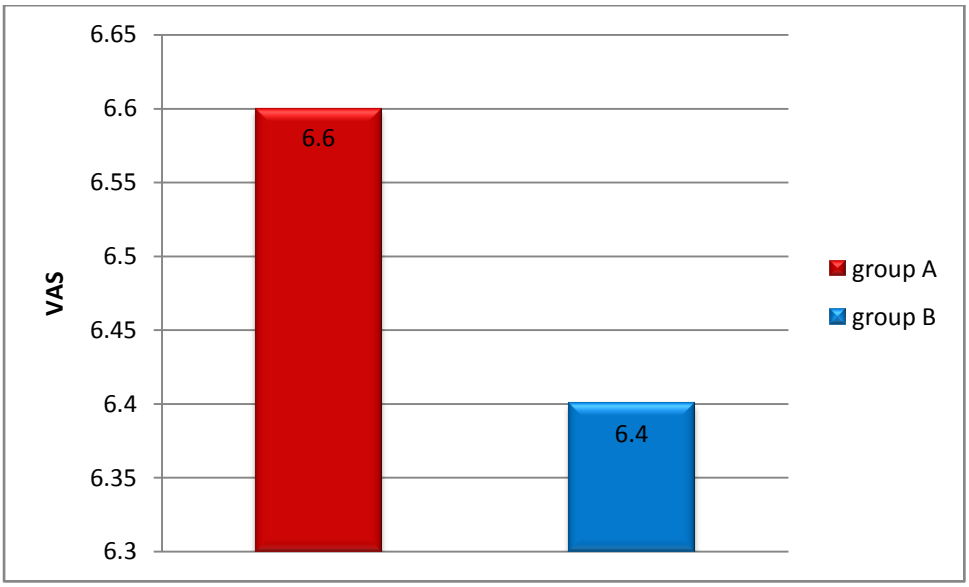
PAIRED ‘t’ TEST (GROUP-B: KINESIO TAPING)

PRE TEST VS POST TEST

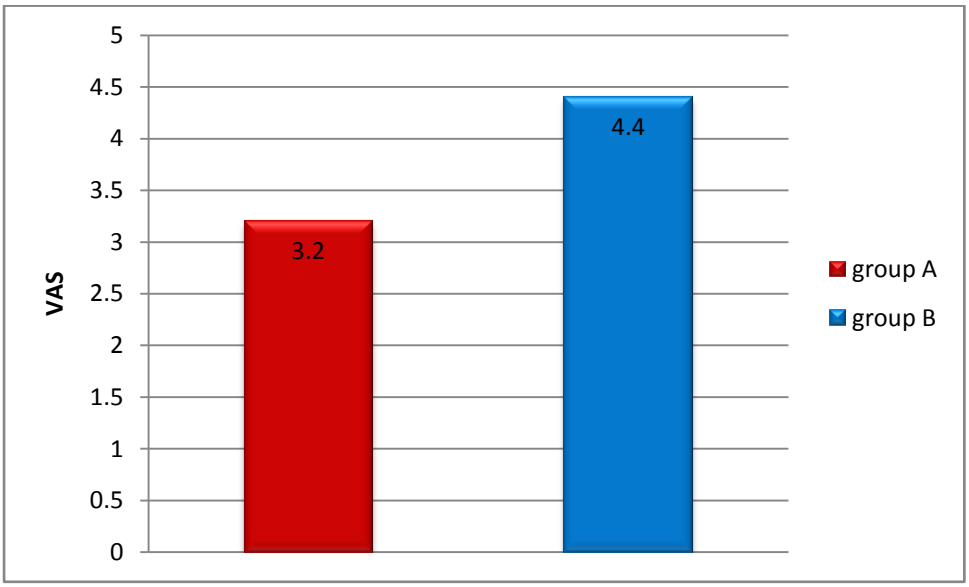


INDEPENDENT ‘t’ TEST:

MCKENZIE PRE TEST VS TAPING PRE TEST



MCKENZIE POST TEST VS TAPING POST TEST



5. DATA ANALYSIS AND RESULTS

MODIFIED OSWESTRY DISABILITY INDEX SCALE

PAIRED 't' TEST:

GROUP : A (PRE TEST AND POST TEST)

't' test analysis within the group A shows that there is significant improvement in functional abilities in individuals with Mechanical Low Back Pain, since the calculated 't' value 15.1065 is greater than the table 't' value 2.2621 at the 5% level of significance ($p<0.05$), the null hypothesis is rejected.

GROUP : B (PRE TEST AND POST TEST)

't' test analysis within the group B shows that there is significant improvement in functional abilities in individuals with Mechanical Low Back Pain, since the calculated 't' value 14.1623 is greater than the table 't' value 2.2621 at the 5% level of significance ($p<0.05$), the null hypothesis is rejected.

INDEPENDENT 't' TEST:

PRE TEST VALUES (GROUP –A, AND GROUP-B)

't' test analysis for the pre test values of group A and group B for functional abilities is 0.5148, which is less than the table 't' value 2.1009 at 5% level of significance, null hypothesis is accepted. It shows there is no significant difference in baseline value regarding functional abilities between the two groups.

POST TEST VALUES (GROUP –A, AND GROUP-B)

't' test analysis for the post test values of group A and group B for functional abilities is 2.2228, which is greater than the table 't' value 2.1009 at 5% level of significance, null hypothesis is rejected. Hence the individuals treated with McKenzie's approach have shown greater improvement than the individuals given taping.

VISUAL ANALOGUE SCALE

PAIRED 't' TEST:

GROUP : A (PRE TEST AND POST TEST)

't' test analysis within the group A shows that there is significant reduction in pain in individuals with Mechanical Low Back Pain, since the calculated 't' value 14.1421 is greater than the table 't' value 2.2621 at the 5% level of significance ($p<0.05$), the null hypothesis is rejected.

GROUP : B (PRE TEST AND POST TEST)

't' test analysis within the group B shows that there is significant reduction in pain in individuals with Mechanical Low Back Pain, since the calculated 't' value 12.0000 is greater than the table 't' value 2.2621 at the 5% level of significance ($p<0.05$), the null hypothesis is rejected.

INDEPENDENT 't' TEST:

PRE TEST VALUES (GROUP –A, AND GROUP-B)

't' test analysis for the pre test values of group A and group B for pain is 0.6493, which is less than the table 't' value 2.1009 at 5% level of significance, null hypothesis is accepted. It shows there is no significant difference in baseline value regarding pain between the two groups.

POST TEST VALUES (GROUP –A, AND GROUP-B)

't' test analysis for the post test values of group A and group B for pain is 3.2478, which is greater than the table 't' value 2.1009 at 5% level of significance, null hypothesis is rejected. hence the individuals treated with McKenzie's approach have shown greater reduction in pain than the individuals given taping.

6. DISCUSSION

As we all know that Mechanical Low Back Pain is a common problem affecting the daily functional activities of a large proportion of the population, it is important to relieve the problem effectively. Many physiotherapy interventional techniques are used in the management of this problem.

This study is to know the effect of McKenzie approach and Kinesio Taping technique in individuals with Mechanical Low Back Pain.

In this study 20 Mechanical Low Back Pain individuals were selected randomly and total parental sample was equally divided into two groups (Group A and Group B) Group A received McKenzie approach 3 sessions per week in 4 weeks. Group B received Kinesio Taping technique 3 sessions per week in 4 weeks.

Data was collected using Visual Analogue Scale for pain and Modified Oswestry Disability Index Scale for functional abilities. Statistical analysis was calculated by using‘t’ test with 95% level of confidence

In the 1950’s the New Zealand physical therapist, Robin McKenzie began to develop a system of assessment and treatment for mechanical back pain based on symptom response to spinal loading. In 1981 he published a book on mechanical diagnosis and therapy of the lumbar spine.

McKenzie developed 3 major classifications of mechanical back pain: postural, dysfunction and derangement syndromes. The definition of dysfunction syndrome includes overstretching of soft tissues that have been shortened or contain contracted scar tissue. Basically, McKenzie chose the term “dysfunction” instead of “adaptive shortening.”

Dysfunction syndrome mechanical and symptomatic responses to loading behave as if adaptive shortening, loss of elasticity, scar tissue formation, etc., are restricting spinal movements. For dysfunction syndrome patients, symptom free movement is accomplished until the end range of a shortened structure is realized, at which point there is prohibition of further range accompanied by symptoms

The goal is to remodel shortened tissue by frequently provoking the discomfort of loading at the restricted end range. Dysfunction syndrome patients tend to avoid their end range discomforts, perpetuating the condition.

McKenzie maintains that once nuclear material has escaped through the annular wall, the inherent hydrostatic mechanism is no longer intact,

Mckenzie exercise increase endorphins and alter perception of pain perhaps by reducing anxiety and depression.

The Mckenzie exercise centralize the pain in core back structures rather than treat pain, that is localized in a specific area, Mckenzie exercise abolish their localized pain which can be acute or chronic.[5]

The overall goal of this Mckenzie exercise program is to reduce pain, develop the muscle support of their trunk and spine and to diminish stress to the intervertebral disc and other static stabilizers of the spine.

Schenk et al[39] found a significant positive difference for pain and function (VAS, Oswestry Disability Index) outcomes for pre-post measures using McKenzie based directional preference exercise

Kinesio Taping, developed by Kenzo Kase in early 70s, is a technique used in the clinical management of people with chronic low back pain. The tape, attached to the skin, is thinner and elastic than normal clinical tape. It can be stretched to 120-140% of its original length, producing mechanical restraint low and less restriction of mobility than conventional tape.[26,27]

Kenzo Kase, said that the therapeutic mechanisms of Kinesio Tape is:

(1) Improving muscle function by strengthened the weak muscles,

(2) Increasing blood and lymph circulation by removing tissue fluid

(3) Reducing pain through neurological suppression,

(4) Repositioning possible subluxed joints by relieving abnormal muscle tension,

helping to return the function of fascia and muscle (Kase et al., 1996)[26].

(5) Increasing proprioception through increased stimulation to cutaneous mechanoreceptors.

Yoshida and Kahanov (2007) Kinesio taping on the lower trunk increased active lower trunk flexion range of motion in healthy subjects, although various mechanisms were postulated to explain this Taping led to great awareness and, greater muscular activation around the area during the treatment period. this have produced mild endurance training effect on the trunk musculature.[42]

Paolini et al (2011) Stated that the people with chronic low back pain were randomly allocated to: Kinesio Taping of the lumbar spine changed every third day: 30 min of supervised exercise three times per week; or a combination of these two interventions. All groups showed reductions in pain and disability over the 4-week treatment period. Comparing between-group of final data show no statistically significant differences between groups. Suggesting that Kinesio Taping may have same acute effects as that of exercise for chronic low back pain, although more precise values are required.[33]

Pain relief in taping group was believed to be because of suppression of pain fibers from the involved segment and also improving proprioception thereby correcting the faulty movements.

Mckenzie approach increases endorphin, centralize the pain, and develop the muscular support of their trunk and spine, so it reduces pain and improves functional ability for Mechanical low back pain individuals.

In dysfunction syndrome there is restriction of spinal movements due to adaptive shortening and loss of elasticity of muscle

Since the Mckenzie approach centralizes pain and develops muscular support of trunk and spine and decreases stress on intervertibral disc. There is a greater pain relief and improvement in functional abilities of Mechanical low back pain individuals.

Hence the study concluded that, there was a significant improvement in both the groups, but the McKenzie approach group showed a greater improvement when compared to Kinesio taping technique group.

7. LIMITATIONS AND SUGGESTIONS

7.1. LIMITATIONS:

- This study has been done with smaller number of subjects. Larger sample is recommended.
- This study was short term study and therefore to make the results more valid long term study should be done.
- There was no control group

7.2. SUGGESTIONS:

- Only pain and functional capacity were studied. Further study can be done including other variables like strength and flexibility.
- Follow up assessment is needed to find out the long term effectiveness on pain and functional abilities.
- Future studies the exercises can be done under the Supervision of therapist.

8. CONCLUSION

Study was to evaluate the effects of McKenzie approach and taping technique in individual with Mechanical low back pain.

The pain status was measured using Visual Analogue Scale and functional abilities was measured using Modified Oswestry Disability Index Scale.

20 subjects were taken from typical population and randomly divided into 2 groups Experimental group A and Experimental group B with 10 in each group.

Experimental group A was given McKenzie approach. Experimental group B was given Kinesio Taping. The values of pain and functional abilities was measured on the beginning of the treatment and end of the 4^{th} week.

The result were analyzed using student 't' test. The result showed there is significant difference between Experimental group A and Experimental group B. Experimental group A improved more than Experimental group B.

Thus as conclusion, the current study provides evidence that McKenzie approach is more effective in reducing pain and improving functional abilities in individuals with Mechanical Low Back

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APPENDIX-I

INFORMED CONSENT FORM

I _____ voluntarily consent to participate in the research study "**THE EFFECTS OF MCKENZIE APPROACH AND KINESIO TAPING TECHNIQUE IN INDIVIDUALS WITH MECHANICAL LOW BACK PAIN"**

The researcher has explained me the treatment approach in brief, the risk of participation and has answered the question related to the research to my satisfaction.

PARTICIANT'S SIGNATURE **RESEARCHER'S SIGNATURE**

SIGNATURE OF A WITNESS

APPENDIX-II

VISUAL ANALOGUE SCALE

0 **10**

No pain **Extreme Pain**

APPENDIX-III

MODIFIED OSWESTRY DISABILITY INDEX SCALE

SECTION 1: TO BE COMPLETED BY PATIENT

Name:_____ Age:_____ Date:_____

Occupation:_____ Number of days of back pain:_____(this episode)

PAIN INTENSITY

_____The pain is mild and comes and goes.

_____The pain is mild and does not vary much.

_____The pain is moderate and comes and goes.

_____The pain is moderate and does not vary much.

_____The pain is severe and comes and goes.

_____The pain is severe and does not vary much.

PERSONAL CARE (WASHING, DRESSING, ETC.)

_____I do not have to change the way I wash and dress myself to avoid pain.

_____I do not normally change the way I wash or dress myself even though it causes some pain.

_____Washing and dressing increases my pain, but I can do it without changing my way of doing it.

_____Washing and dressing increases my pain, and I find it necessary to change the way I do it.

_____Because of my pain I am partially unable to wash and dress without help.

_____Because of my pain I am completely unable to wash or dress without help.

LIFTING

_____I can lift heavy weights without increased pain.

_____I can lift heavy weights but it causes increased pain

_____Pain prevents me from lifting heavy weights off of the floor, but I can manage if they are conveniently positioned (ex. on a table, etc.).

_____Pain prevents me from lifting heavy weights off of the floor, but I can manage light to Medium weights if they are conveniently positioned.

_____I can lift only very light weights.

_____I can not lift or carry anything at all.

WALKING

_____I have no pain when walking.

_____I have pain when walking, but I can still walk my required normal distances.

_____Pain prevents me from walking long distances.

_____Pain prevents me from walking intermediate distances.

_____Pain prevents me from walking even short distances.

_____Pain prevents me from walking at all.

SITTING

_____Sitting does not cause me any pain.

_____I can only sit as long as I like providing that I have my choice of seating surfaces.

_____Pain prevents me from sitting for more than 1 hour.

_____Pain prevents me from sitting for more than 1/2 hour.

_____Pain prevents me from sitting for more than 10 minutes.

_____Pain prevents me from sitting at all.

SECTION 2 (CON'T): TO BE COMPLETED BY PATIENT

STANDING

_____I can stand as long as I want without increased pain.

_____I can stand as long as I want but my pain increases with time.

_____Pain prevents me from standing more than 1 hour.

_____Pain prevents me from standing more than 1/2 hour.

_____Pain prevents me from standing more than 10 minutes.

_____I avoid standing because it increases my pain right away.

SLEEPING

_____I get no pain when I am in bed.

_____I get pain in bed, but it does not prevent me from sleeping well.

_____Because of my pain, my sleep is only 3/4 of my normal amount.

_____Because of my pain, my sleep is only 1/2 of my normal amount.

_____Because of my pain, my sleep is only 1/4 of my normal amount.

_____Pain prevents me from sleeping at all.

SOCIAL LIFE

_____My social life is normal and does not increase my pain.

_____My social life is normal, but it increases my level of pain.

_____Pain prevents me from participating in more energetic activities (ex.sports,dancing,etc.)

_____Pain prevents me from going out very often.

_____Pain has restricted my social life to my home.

_____I have hardly any social life because of my pain.

TRAVELLING

_____I get no increased pain when travelling.

_____I get some pain while travelling, but none of my usual forms of travel make it any worse.

_____I get increased pain while travelling, but it does not cause me to seek alternative forms of travel.

_____I get increased pain while travelling which causes me to seek alternative forms of travel.

_____My pain restricts all forms of travel except that which is done while I am lying down.

_____My pain restricts all forms of travel.

EMPLOYMENT/HOMEMAKING

_____My normal job/homemaking activities do not cause pain.

_____My normal job/homemaking activities increase my pain, but I can still perform all that is required of me.

_____I can perform most of my job/homemaking duties, but pain prevents me from performing More physically stressful activities (ex. lifting, vacuuming)

_____Pain prevents me from doing anything but light duties.

_____Pain prevents me from doing even light duties.

____ Pain prevents me from performing any job or homemaking chores.